オーストラリア南極科学戦略計画(2011/12-2020/21)：オーストラリア南極局における大気科学研究

アンドリュー　クレコチュック[1]、サイモン　アレキサンダー[1]、ジョン　フレンチ[1]、レイ　モリス[1]、ダミアン　マーフィー[1]
[1] オーストラリア南極局、気候プロセス変動グループ

Australian Antarctic Division contributions to Atmospheric Science in the Australian Antarctic Science Strategic Plan 2011/12 – 2020/21

Andrew Klekociuk[1], Simon Alexander[1], John French[1], Ray Morris[1] and Damian Murphy[1]
[1]*Climate Processes and Change, Australian Antarctic Division*

The Australian Antarctic Science Strategic Plan 2011/12 ï 2020/21 has recently been drafted by the Australian science community and adopted to guide scientific activities within the Australian Antarctic Program from July 2012. The Climate Processes and Change theme includes an atmospheric science component that focuses on óAtmospheric processes and changeô (Stream 1.3) through the goals of

- Characterising atmospheric processes, variability and change; and
- Model development for weather and climate predictions.

Scientists in the Australian Antarctic Division (AAD) are making a significant contribution to this stream, principally through three externally approved projects.

ñPolar FORCeS: Polar Feedbacks between Ozone Recovery and Climate in the Southern hemisphereò (Project number 4012 ï PI: Andrew Klekociuk) has as its overarching objective, the quantification of feedbacks and changes to climate in the Southern Hemisphere (SH) due to variability and trends in the zonal asymmetry of stratospheric ozone. It focuses on the Antarctic, Southern Ocean (SO) and Australian region during the epoch of ozone recovery in the 21st century. The project will achieve this goal through a combination of Global Climate Model (CGM) runs using fully three dimensional ozone fields, Chemistry Climate Model (CCM) runs and analysis of the model data to investigate the influence of ozone on trends and variability in near surface climate.

ñGravity wave drag parameterization in climate modelsò (Project number 4025 ï PI: Damian Murphy) seeks to enhance predictions of stratospheric and tropospheric climate responses to future climate change through improvements to the gravity-wave drag parameterization schemes used in climate models. To achieve this, the project will: compare the wave representation embedded in GWDP schemes to observed or inferred (through modeling and ray tracing studies) gravity wave source, propagation and deposition characteristics of the southern polar atmosphere; and assess the sensitivity of numerical models to changes in GWDP schemes (with an emphasis on the Australian ACCESS model and the southern polar atmosphere).

ñMesospheric OH Climate Assessment (MOHCA)ò (Project number 4157 ï PI: John French) aims to provide improved long-term trend assessments of high latitude upper atmospheric temperature by extension of the OH temperature record and understanding sources of variability in this region. These observations will be used to monitor, detect and quantify change at in the atmosphere and to provide comparison and validation data for models and other ground based and satellite observations.

Australian Antarctic Division scientists are also collaborating with colleagues at Utah State University on project ñAntarctic Gravity Wave Imaging Network (ANGWIN) for Collaborative Mesospheric Researchò (Project 4065 ï PI Michael Taylor).

Davis observatory operations will continue to collect magnetic and ionospheric measurements. Similar measurements are ongoing at the other Australian stations. The archive of these and other atmospheric parameters (including an extensive set of observations of southern hemisphere polar mesosphere summer echoes, and Rayleigh LIDAR measurements of temperature and backscatter characteristics in the stratosphere and mesosphere) are available for current and future research activities. AAD scientists are developing new projects for the next round of Antarctic Science applications and look forward to strengthening the atmospheric program by forging new collaborative relationships.